Comparison between Blue Intensity (BI) and Maximum Latewood Density (MXD) tree-ring chronologies from the North American Boreal forests

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Tree ring-width (TRW) and Maximum Latewood Density (MXD) series have been largely used to develop high-resolution temperature reconstructions for the Northern Hemisphere. The divergence phenomenon, a weakening of the positive relationship between TRW and summer temperatures, has been observed particularly in northwestern North America chronologies. In contrast, MXD datasets have shown a more stable relationship with summer temperatures, but it is costly and labor-intensive to produce. Recently, methodological advances in image analyses have led to development of a less expensive and labor-intensive MXD proxy known as Blue Intensity (BI). Here, we compare 6 newly developed BI tree-ring chronologies of white spruce (*Picea glauca* [Moench] Voss) from high-latitude boreal forests in North America (Alaska in USA; Yukon and the Northwestern Territory in Canada), with MXD chronologies developed at the same sites. We assessed the quality of BI in relation to MXD based on mean correlation between trees, chronology reliability based on the Expressed Population Signal (EPS), spectral properties, and the strength and spatial extent of the temperature signal. Individual BI chronologies established significant correlations with summer temperatures showing a similar strength and spatial cover than MXD chronologies. Overall, the BI tree-ring data is emerging as a valuable proxy for generating high-resolution temperature spatial reconstructions over northwestern America.